

**(19) World Intellectual Property  
Organization  
International Bureau**



**(43) International Publication Date**  
**22 January 2004 (22.01.2004)**

**(10) International Publication Number**  
**WO 2004/008538 A1**

**(51) International Patent Classification<sup>7</sup>:** H01L 27/14.  
31/10

**(21) International Application Number:**  
PCT/JP2003/008057

(22) International Filing Date: 25 June 2003 (25.06.2003)

(25) Filing Language: English

(26) Publication Language: English

**(30) Priority Data:**

2002-202986	11 July 2002 (11.07.2002)	JP
2003-158501	3 June 2003 (03.06.2003)	JP

(74) Agents: HARA, Kenzo et al.; HARAKENZO PATENT LAW FIRM, Daiwa Minamimorimachi Building, 2-6, Tenjinbashi 2-chome Kita, Kita-ku, Osaka-shi, Osaka 530-0041 (JP).

**(81) Designated States (national):** AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, ME, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) **Designated States (regional):** ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

**Published:**

— with international search report

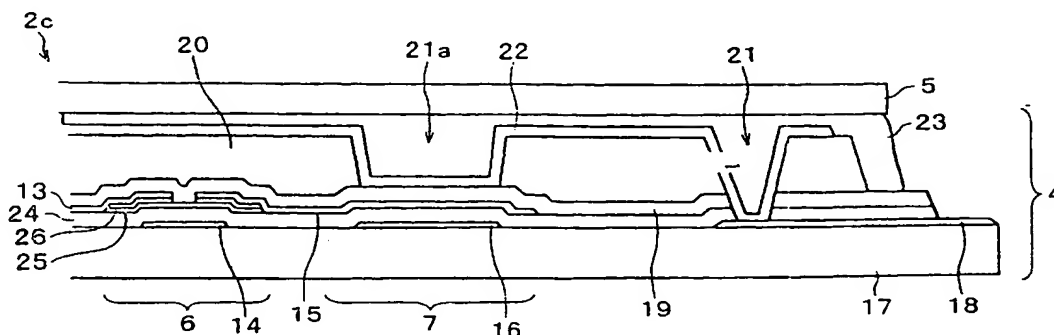
*For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*

(71) Applicant (for all designated States except US): SHARP  
KABUSHIKI KAISHA [JP/JP]; 22-22, Nagaike-cho,  
Abeno-ku, Osaka-shi, Osaka 545-8522 (JP).

(72) Inventor; and

(75) **Inventor/Applicant (for US only):** IZUMI, Yoshihiro  
[JP/JP]; 494-16, Kuzumoto-cho, Kashihara-shi, Nara  
634-0007 (JP).

(54) Title: PHOTOELECTRIC CONVERSION DEVICE, IMAGE SCANNING APPARATUS, AND MANUFACTURING METHOD OF THE PHOTOELECTRIC CONVERSION DEVICE



(57) Abstract: A conductive layer and a connection electrode of the image sensor are directly in contact with each other and are electrically connected to each other, so that a conventional conductive connector is unnecessary. The cost is reduced by omitting the conductive connector, and the cost is further reduced by reducing the processes. Since the conductive connector is unnecessary, accuracy is not required upon manufacturing, so that an image sensor of lower cost is provided. An opening portion is provided to form a new pixel capacitor between the conductive layer and a polar plate of the pixel capacitor section, so that the pixel capacitance is increased without largely changing the conventional processes.

**WO 2004/008538 A1**